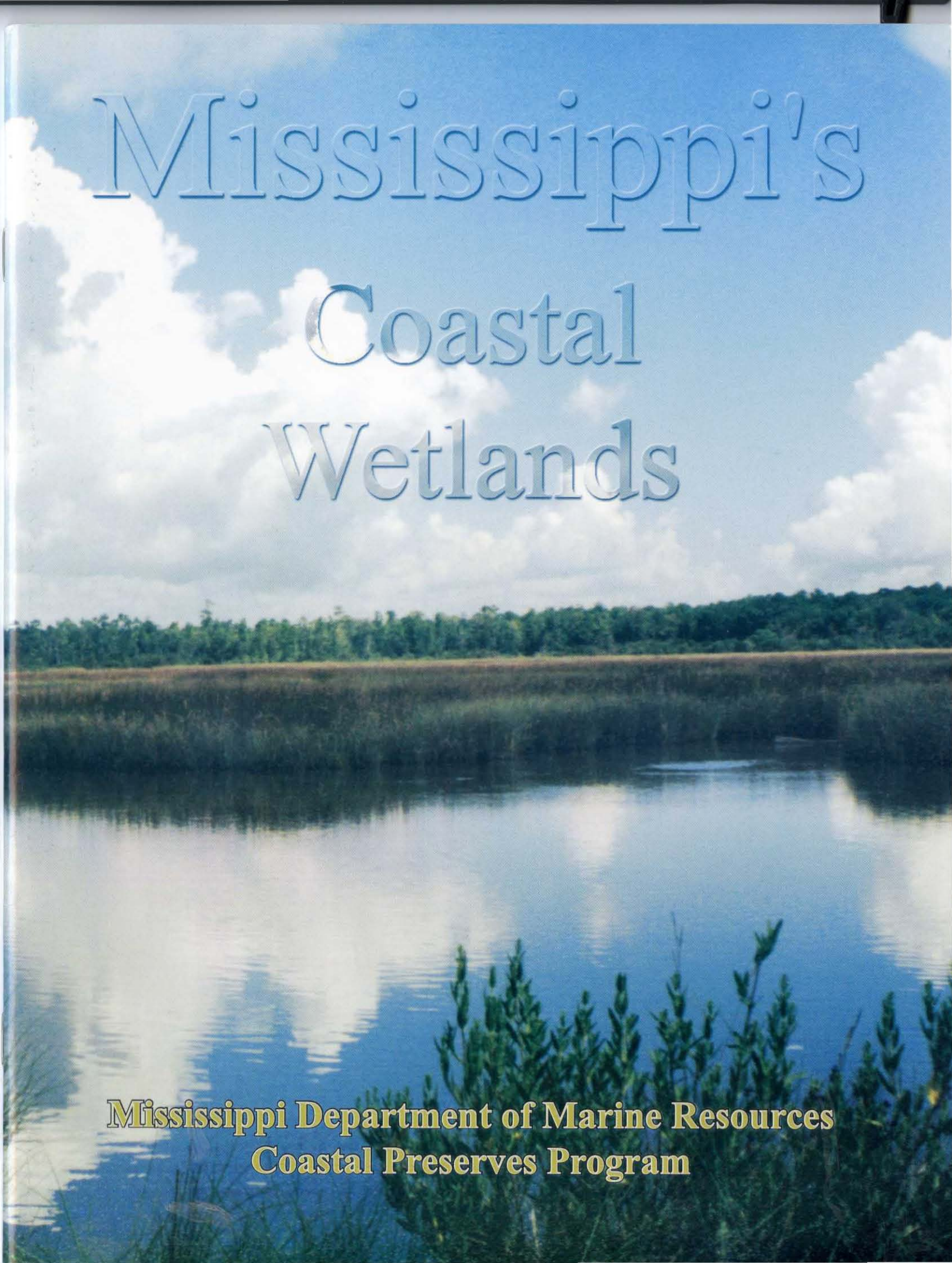
Mississippi's
Coastal
Wetlands
Mississippi Department of Marine Resources
Coastal Preserves Program

Mississippi's Coastal Wetlands

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Mississippi Coastal Wetlands

Introduction

The State of Mississippi comprises many diverse upland and wetland habitats; but, nowhere in the state can you find habitats that are more functionally important than the dynamic coastal wetland habitats located along the beautiful Mississippi Gulf Coast in Hancock, Harrison and Jackson Counties.

The Mississippi Legislature recognized the importance of the state's coastal wetlands in 1973 and passed the Coastal Wetlands Protection Law. The Mississippi Coastal Wetlands Protection Law states, "**It is declared to be the public policy of this state to favor the preservation of the natural state of the coastal wetlands and their ecosystems and to prevent the despoliation and destruction of them, except where a specific alteration of specific coastal wetlands would serve a higher public interest in compliance with the public purposes of the public trust in which coastal wetlands are held.**"

What exactly is a **Coastal Wetland**? Vegetated coastal wetlands include salt and brackish marshes, tidal freshwater marshes and swamps, and submerged aquatic vegetation beds. Non-vegetated coastal wetlands include tidal, open water habitats such as bayous, and river channels, oyster beds, the Mississippi Sound and the Gulf of Mexico.

Today it is estimated that the State of Mississippi contains approximately 64,000 acres of vegetated coastal wetlands.

How do Mississippi's coastal wetlands differ from federally regulatory wetlands? Wetlands are transitional habitats between upland and aquatic systems where the land is submerged or the water table beneath the land is at or near the surface for most of the year. However, a habitat is not considered to be a regulatory wetland by the federal government unless it can be shown that it possesses three essential elements: hydrology, hydric soils and hydrophytic vegetation. **Hydrology** refers to the presence of water during a plant's growing season. Water in a wetland can come from above the ground from rain or runoff, or from below the ground from the water table.

Hydric soils are those soils that are saturated, ponded or flooded long enough during the growing season to develop anaerobic (un-oxygenated) conditions. **Hydrophytic vegetation** refers to those plants that have become adapted to growing in saturated conditions. Because the substrates of many of Mississippi's coastal wetlands (i.e. rivers and bayou channels, portions of the Mississippi Sound and the Gulf of Mexico) do not support emergent vegetation, these areas are not technically considered wetlands by the federal government. Instead, these special aquatic sites are federally classified as deepwater habitats, mudflats or vegetated shallows.

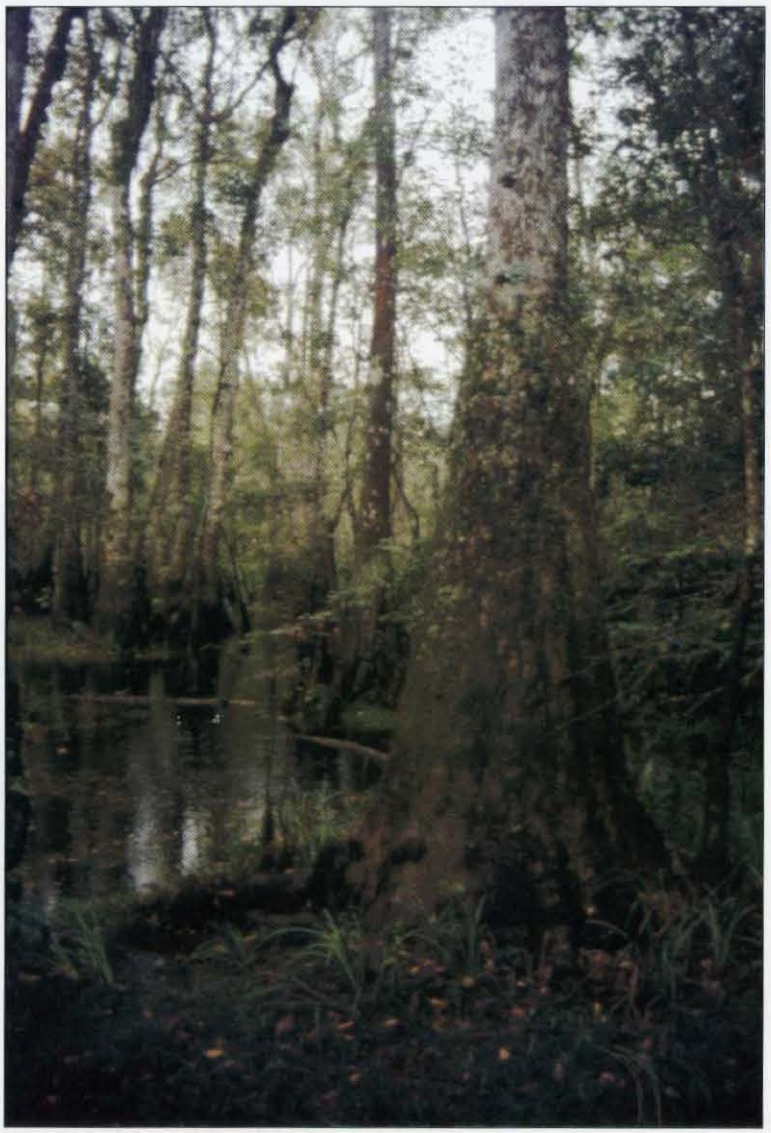
During periods of drought, a wetland may appear to be dry because the water table has dropped below the surface; nevertheless, the root zone of the plants remains saturated with water. When a drought occurs, visual indicators of hydrology other than standing water may be used to help verify the hydrology within a wetland. These indicators of hydrology include watermarks on trees or other structures, drift lines, sediment deposits on plants and drainage patterns.

RETROSPECT

Manmade wetland loss in coastal Mississippi began with the early Native American populations and continues to occur today. It is estimated that before 1930 over 1,000 acres of Mississippi's coastal marshes were destroyed. Between 1930 and 1973 approximately 8,170 acres of coastal marshes were filled for industrial and residential uses.

Since 1973, as a result of the passage of the Mississippi Coastal Wetlands Protection Law and the development of the Mississippi Coastal Program, coastal wetland loss in the State has slowed tremendously. All coastal wetland losses today must be mitigated for in accordance with a "No net loss" policy. This mitigation involves an alternative analysis to determine if other, less environmentally sensitive areas exist for a project, employing minimization efforts that can lead to the reduction in scope of a project, and finally, compensation which requires the preservation, restoration or creation of wetlands in return for the loss or degradation of the coastal wetland habitat.

It was estimated in 1973 that Mississippi contained over 66,108 acres of salt marshes and approximately 823 acres of freshwater marshes. Today it is estimated that the state contains 64,000 acres of vegetated coastal wetlands.



Pacagoula Wildlife Management Area *(Photo by Jennifer Buchanan)*

MANAGEMENT

Hydric soils are formed when air is displaced by water and the soil or substrate becomes devoid of oxygen, becoming what is termed "anoxic."

The Mississippi Department of Marine Resources (DMR) is the state agency with the primary responsibility for managing Mississippi's coastal wetlands. The DMR, through its Office of Coastal Ecology, manages coastal wetlands by following the guidelines set forth in the Mississippi Coastal Program (MCP). The MCP outlines procedures that must be followed and permits that must be issued before any regulated activity may take place in a coastal wetland. Additionally, the Mississippi Secretary of State's Office comments on all major projects and is responsible for leasing the public trust tidelands/coastal wetlands for specific uses.

Tidelands are those lands that are daily covered and uncovered by water by the action of the tide up to the mean line of the ordinary high tide. This definition is similar to that of the coastal wetlands; however, Mississippi tidelands include not only existing coastal wetlands but also those coastal wetlands that have been filled in since statehood in 1817 for one purpose or another resulting in upland habitat.

In an effort to protect and manage Mississippi's diminishing coastal wetland resources, the DMR, initiated the Coastal Preserves Program in 1992. The responsibilities charged to the Coastal Preserves Program include the protection of sensitive coastal habitats, development of individual management plans to protect flora and fauna, and

Hancock County Marsh Restoration Site *(Photo by Dennis Heuer)*

identifications of alternative approaches for protecting and restoring wetlands along the Mississippi Gulf Coast. The Mississippi Secretary of State's Office is an active partner in the Coastal Preserves Program through an established cooperative agreement whereby both agencies agree to work together towards effectively managing and protecting Mississippi's coastal wetlands.

Davis Bayou *(Department of Marine Resources File Photo)*

—HABITAT PARAMETERS—

Mississippi's coastal wetlands are all part of a vast estuarine system. An **estuary** forms where "the river meets the sea." Fresh water from local rivers mixes with the saltier sea water of the Gulf of Mexico to form a zone of brackish (lower salinity) water that extends from the northern beaches of Mississippi's barrier islands inland to the bays and bayous of the mainland.

The type of coastal wetland habitat an area can support is determined by its location within the landscape. The salinity of the adjacent waters and the elevation of the site play the largest roles in the determination of the habitat type. Therefore, habitats located near the mouth of a river and at a low elevation will be different from those located further up the river or at a higher elevation.

Salinity levels within our coastal wetlands range between full seawater strength (35 parts per thousand) in open-water areas located south of our barrier islands, to completely freshwater levels (0 parts per thousand) in tidal areas located higher upstream in the rivers feeding into the Sound. Many plants and animals have a specific range of salinity they can tolerate. If the waters become too fresh or too salty, the animals must be able to migrate into waters with an acceptable salinity level, or they will perish. The plants are not so lucky. If the salinity changes significantly over a long period of time, the plants will die and eventually be replaced by other species more tolerant of the local conditions.

Rainfall, or the lack of it, is the primary environmental factor that influences salinity levels on the Mississippi Gulf Coast. Too much rainfall decreases the salinity and can cause commercially important species of seafood such as shrimp to leave the protection of the estuary before they are big enough to harvest. **Sessile** (permanently attached) species such as oysters often die after a period of unusually heavy rainfalls because they are unable to move away from the rain-generated, lower-salinity water. Too little rainfall causes the salinity level to rise, and the resulting higher salinity favors oyster predators like the oyster drill creating similar problems for the oyster.

The elevation of a coastal wetland is also very important. Coastal marshes are often called "high" or "low" marshes. **Low marshes** are Mississippi's true coastal wetlands—located below the mark of mean high water. Low marshes are often flooded with water and are much more susceptible to changes in salinity. **High marshes** are usually located landward of low marshes and are covered with water only during higher-than-average tidal events. High marshes are not necessarily coastal wetlands as they are located above the mark of mean high water; however, they are managed by the DMR because of their adjacency to the coastal wetlands.

Because coastal wetlands are affected daily by the rise and fall of the tides, the animals and plants that inhabit them must be able to adapt to a wide range of conditions. At high tide, the coastal wetland marshes are covered with water, while at low tide, there may be no water at all covering the marsh surface. Thus, water-dependent animals (such as fiddler crabs) that live in coastal marshes must be able to exist temporarily without water, while juvenile and larval fish must be able to move with the water by swimming away into deeper water as the water level falls. Other animals such as raccoons and clapper rails must be able to move away from the rising water either by swimming, flying or crawling upward or landward.

Because rooted coastal wetland plants cannot move away from the rising water, they have developed adaptations allowing them to live in an area where the soils are almost continuously inundated with water and devoid of oxygen. These wetland soils are called hydric soils. To compensate for this lack of oxygen, some wetland plants have been found to pump air that they have absorbed through their leaves down to their roots. Other plants are thought to grow alternative gas exchange structures that extend above the water's surface (for example, cypress "knees").

Habitat Types

Hancock County Marsh *(Photo by Jan Boyd)*

Tidal Salt and Brackish Marshes

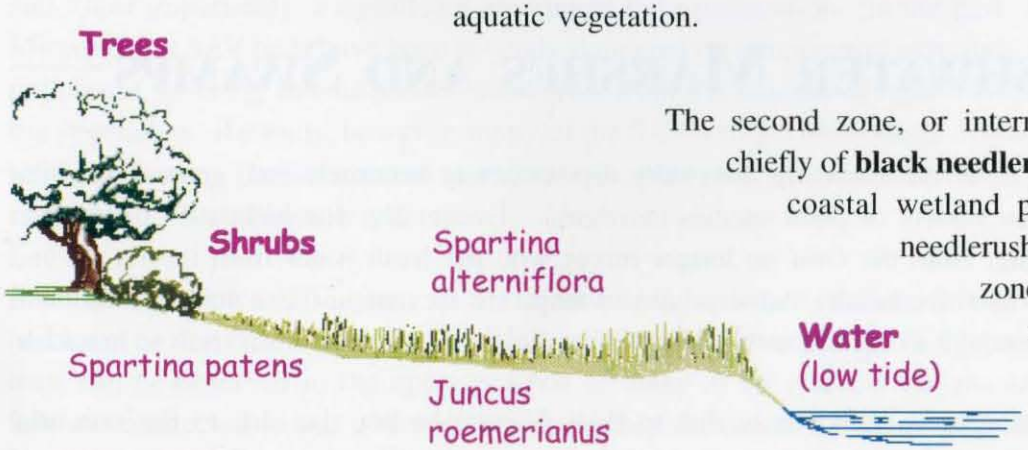
Mississippi's salt and brackish marshes are located near the mouths of mainland coastal river systems and adjacent to island bayous. Because the plants within this habitat type, espe-

cially those at lower elevations, must be very salt-tolerant, very few species of plants can grow here. Although these marshes are the least diverse botanically (i.e. they support only a few species of plants) and they have a low organic soil content, they are among the most productive habitats on earth.

Grand Bay Coastal Preserve, *Jackson County (Photo by Jan Boyd)*

Tidal marshes release nutrients in the form of **detritus**, composed primarily of small fragments of decomposing plant material, into the adjacent waters for use by other organisms. The back and forth movement of the tides washes the detritus into the adjacent shallows where small fish and invertebrates feed on it. Simple plants called **algae** found in association with the salt marshes, mud flats and the submerged grass beds also provide an important food source for these small organisms.

Salt and brackish marshes can be divided into three main vegetative zones determined by elevation. The first and lowest zone, composed predominantly of **smooth cordgrass** (*Spartina alterniflora),* grows as a fringe adjacent to open water and is regularly inundated by the tides. Smooth cordgrass is most common along the saltier waterways but is replaced by **wild rice** *(Zizania quatica)* and **black needlerush** (*Juncus roemerianus*) farther upstream within this zone. Several species of algae are also found in association with these emergent species of aquatic vegetation.



The second zone, or intermediate elevation, is composed chiefly of **black needlerush**, Mississippi's most common coastal wetland plant. Vast expanses of black needlerush are found throughout the coastal zone. Like its name implies, black needlerush is a pointy, needle-like plant which usually grows at a slightly higher elevation than the cordgrass although the two vegetative

zones may overlap slightly. Higher-than -average tides inundate this vegetative zone. Farther upstream as the salinity decreases, **bulrushes** (*Scirpus*) and **salt reed-grass** (*Distichlis spicata*) as well as many other species grow along side the black needlerush.

Hancock County Marsh Coastal Preserve *(Photo by Jan Boyd)*

Finally, the highest vegetative zone is composed predominantly of salt marsh hay (*Spartina patens*). **Salt marsh hay** is a wiry grass that, as its name implies, was once used as a feed for cattle. Common shrubs located along the upland edge of this zone include **wax myrtle** (*Myrica cerifera*) and **false-willow** (*Baccharis angustifolia*). Only unusually high tidal events, such as tidal surges associated with hurricanes, will cause these wetland zones to be flooded.

A few of Mississippi's salt marshes contain a unique feature called a **salt flat** or **salt pan**. These salt flats are sparsely vegetated because the soils within these sites have a much higher salt content than the adjacent wetland areas. Salt grass and several species of succulent plants such as glassworts and saltworts can commonly be found in this special habitat. Located just south of Biloxi's mainland, Deer Island, one of Mississippi's nearshore islands, contains a fine example of a salt marsh including one of the largest salt flats in south Mississippi.

Tidal Freshwater Marshes and Swamps

The farther you proceed upriver from the coast, the less salty the waterway becomes; and, generally, as the salinity of the water decreases, the variety of plant species increases. Eventually, due mainly to a reduction in tidal movement, the saltier water from the Gulf no longer mixes with the fresh water from the rivers, and the waters are said to be fresh. Tidal freshwater marshes and swamps are located in these areas where there is still some tidal action, but not enough to significantly change the salinity of the water from fresh to brackish.

The water levels within these habitats vary, not only due to tidal fluctuation but also due to the non-tidal changes in the river stages controlled by the amount of rainfall the watershed receives. During periods of drought, these habitats may not be covered with water; while during periods of flood, these habitats may be submerged for days or weeks at a time.

A tidal marsh is dominated by hydrophytic herbaceous vegetation, while a tidal swamp is dominated by hydrophytic woody shrubs and trees. Common plants in the tidal marshes include spikerushes, arrowheads, sawgrass, pickerelweed and cattails. Common trees in tidal swamps include the bald-cypress and the water tupelo gum. Exceptional examples of tidal freshwater marshes and swamps can be found on the Wolf River in Harrison County and along the Pascagoula River in Jackson County.

–Submerged Aquatic Vegetation Beds–

Submerged aquatic vegetation (SAV) refers to vegetation rooted in the bottom substrate and usually growing beneath the water surface for most of its lifestage. These beds are located in fresh and brackish/marine waters of the Mississippi Sound and its adjacent waters. Common plants in freshwater SAV beds include such native species as eel grass or tape grass, bladderwort, coontail and introduced nuisance species such as Eurasian watermilfoil.

Brackish or marine SAV beds are often referred to as **seagrass beds**. These beds are generally located in higher salinity waters located within the Mississippi Sound. Five species of seagrass have been documented in the waters of Mississippi: turtlegrass, manatee grass, shoal grass, star grass and widgeon grass.

Many species of **epiphytic** red, brown and green algae as well as **macroalgae** species have been documented in association with SAV beds. SAV beds and the associated epiphytes and macroalgae help improve water quality and provide food and protection for the majority of our estuarine-dependent fish and migratory waterfowl. When the SAV beds are uncovered at low tide, resident and migratory wading birds may forage among the grass blades and roots for small fish.

SAV beds are very dynamic and unpredictable habitats. Some beds have persisted for decades while others change with the seasons. SAV requires appropriate sediments and, most importantly, a significant amount of light penetration. In the past, many of Mississippi's SAV beds have been severely damaged by temperature extremes, salinity, pollutants, scouring and suspended solids that limit the amount of light that can reach the vegetation. Recently, however, many of the SAV's in the Mississippi Sound appear to be recovering, possibly due to an increase in watershed management efforts that are ongoing in coastal Mississippi.

Construction of breakwaters and baffles, both floating and fixed, establishment of No Wake Zones, revegetation of shorelines and the renourishment of beaches are all methods that have been employed to try to reduce the degree of coastal erosion.

Excellent examples of seagrass beds can be found just north of Horn Island on what is known as the Middle Ground and just off the northwest end of Cat Island. SAV beds can be observed in the upper reaches of many of the shallow bayous and lakes that are connected to our coastal rivers including the mouth of the Jourdan River in Hancock County.

Mississippi Coastal Preserve Program

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5 0 5 10 15 Miles

-- For Planning Purposes Only --

Based on USGS 1:100,000 Digital Line Graph (DLG) data. Contact the Mississippi Department of Marine Resources (DMR) for questions concerning contents. This map supports the 1997 Coastal Preserves Program annual report.

- Major Roads
- Roads
- Pascagoula River Marshes
- Round Island
- Ship Island
- Petit Bois Island
- Horn Island
- Hancock Co. Marsh
- Grand Bayou
- Graveline Bay
- Grand Bay
- Old Fort Bayou

Mississippi Sound

- Escatawpa River Marshes
- Deer Island
- Davis Bayou
- Cat Island
- Belle Fontaine Marshes
- Biloxi River
- Bayou LaCroix
- Wolf River
- Bayou Portage
- Jourdan River

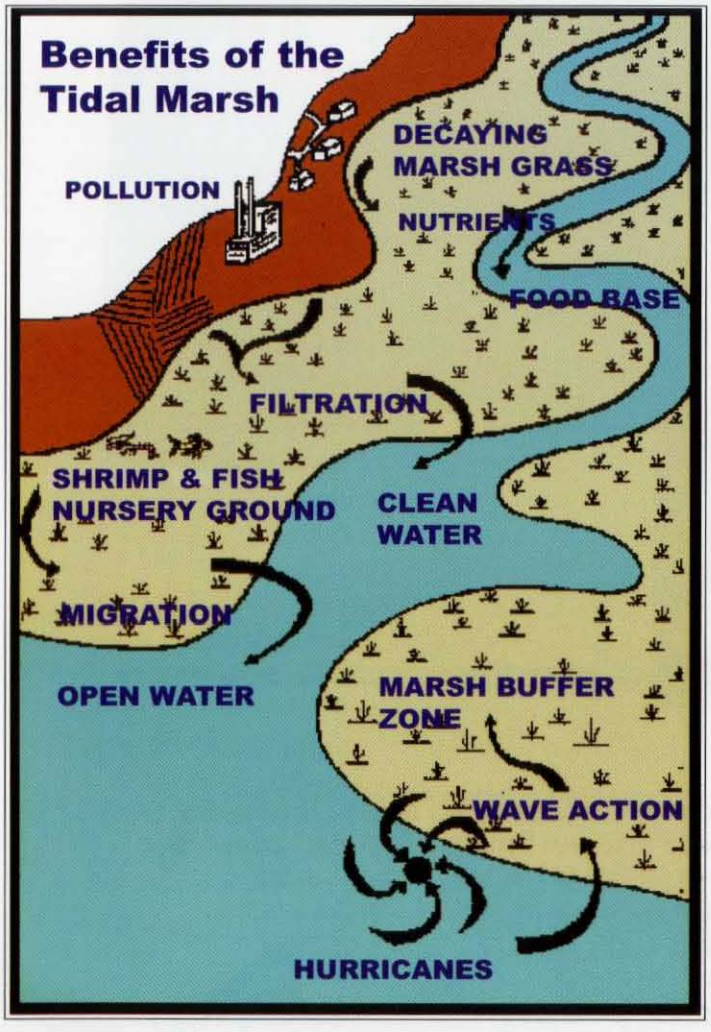
In May 1992, the Mississippi Department of Marine Resources established the Coastal Preserves Program to protect sensitive coastal habitats. The objective of the Mississippi Coastal Preserves Program is to acquire and protect coastal wetland habitat forever as a Mississippi state natural area preserve for the preservation, protection, restoration and sustenance of its natural characteristics and features, and its ecological integrity as coastal marsh and associated habitats.

Non-Vegetated Coastal Wetlands

Tidal openwater habitats such as rivers, bayous, the Mississippi Sound and the Gulf of Mexico are all considered coastal wetlands in Mississippi. Four major drainage areas flow into the Mississippi Sound: the Pearl River drainage area; the Bay St. Louis drainage area, which includes the Jourdan and Wolf Rivers, and Bayous LaCroix and DeLisle; the Biloxi Bay drainage area which includes the Tchoutacabouffa and Biloxi Rivers, and Bernard, Fort and Davis Bayous; and the Pascagoula drainage area which includes the Pascagoula and Escatawpa Rivers, and Bluff Creek, Page Bayou and Point Aux Chenes Bay and its associated bayous.

Mississippi's oyster beds are also important open water coastal wetlands. Oyster beds are located in many of our nearshore waters, especially in the waters of the western Mississippi Sound. These beds not only provide a substrate for oyster spat (larvae) to set, but they also provide food and cover for many small fish and invertebrates. Larger fish such as red and black drum frequently congregate on these beds to feed on these small fish. Manmade low-profile fishing reefs located throughout the Mississippi Sound also provide similar habitat benefits.

Adjacent Wetlands



Three important wetland types frequently located adjacent to coastal wetlands are high saltmarsh, bottomland hardwood forests and wet pine flatwoods/ pine savannas. These wetlands serve as important buffer areas for our coastal wetlands.

Bottomland hardwood forests are located adjacent to **riverine** coastal wetlands, so they are often inundated with floodwaters for weeks or months at a time. The soils within these bottomland habitats are rich with nutrients deposited during these floods. Dominant plants within this habitat type include hardwood trees such as water oak, sweetbay and red maple. Deer, turkey and migratory birds are abundant in these woods.

Wet pine flatwoods and **pine savannas** are two similar wetland habitat types that can be found within the coastal plain. Wet pine flatwoods differ visually from the savannas by having a greater number of pine trees. Pine savannas and wet pine flatwoods are characterized by nutrient poor soils having poor surface drainage and are often "perched" on top of a layer of non-porous soil such as clay.

This non-porous layer acts like a pan that holds water around the plant roots until it is able to leave though evaporation or transpiration activities. Additionally, these habitats require regular fires to maintain their botanical diversity.

Wolf River Coastal Preserve *(Photo by Jan Boyd)*

Some of the coast's most interesting vegetation is found in these diverse pine savanna and pine flatwood wetlands. Insect-eating plants such as pitcher plants and sundews as well as many species of orchids, grasses and sedges are common throughout these wetlands. The Mississippi Sandhill Crane, an endangered species, is completely dependent upon these habitats. The proposed Grand Bay National Estuarine Research Reserve located in Southeastern Jackson County is being established to protect these unique savannas as well as the coastal wetlands that are associated with them.

Wetland Functions

Much of Mississippi's remaining tidal wetlands contain natural landscapes, fragile ecological communities and a diversity of unique fauna and flora. These coastal wetlands perform important ecological roles in flood control and recharging the groundwater as well as acting as pollution filters, sediment and toxicant traps, primary production areas, and important nursery areas that contribute to the productivity of an abundant fishery resource. Wetlands also provide excellent educational opportunities for observing nature and scientific research.

"The frog does not drink up the pond in which he lives."
-Native American Proverb

Wetlands are important in flood control and water storage and regularly recharge the water table along Mississippi's coast. For example, a 6-inch rise in a 10-acre marsh replaces more than 1.5 million gallons of water in storage. Wetlands are able to hold vast quantities of water during floods while slowly releasing it to downstream areas.

Sandhill Crane Refuge, Jackson County *(Photo by Jan Boyd)*

During tropical storms or hurricanes, Mississippi's coastal wetlands serve as important storm surge protection. Research has shown that for every mile of wetland vegetation, storm surge height can be reduced by one foot.

Wetland vegetation has complex root systems that bind and protect the soil from erosion. This vegetation also reduces flood flows, thus trapping and holding sediment that would otherwise enter lakes and streams, ultimately killing fish and filling in these bodies of water with sediment.

In our coastal areas, wetlands are very important sources of nutrients for shellfish and finfish. As wetland plants die, the plant tissues are transformed into minute fragments of nutrient rich detritus by bacteria and fungi which are carried into surrounding waterways and eventually into offshore waters. This detritus is an important food source for juvenile crustaceans (shrimp and blue crabs) and many species of fish.

Many species of wildlife, including migratory birds, inhabit both coastal and inland wetlands. Although wetlands occupy only 5 percent of the nation's lands, approximately 35 percent of all rare and endangered animal species and several endangered plant species are partially or entirely dependent upon wetland habitats for survival. These include the Brown Pelican, Sandhill Crane, and Bald Eagle.

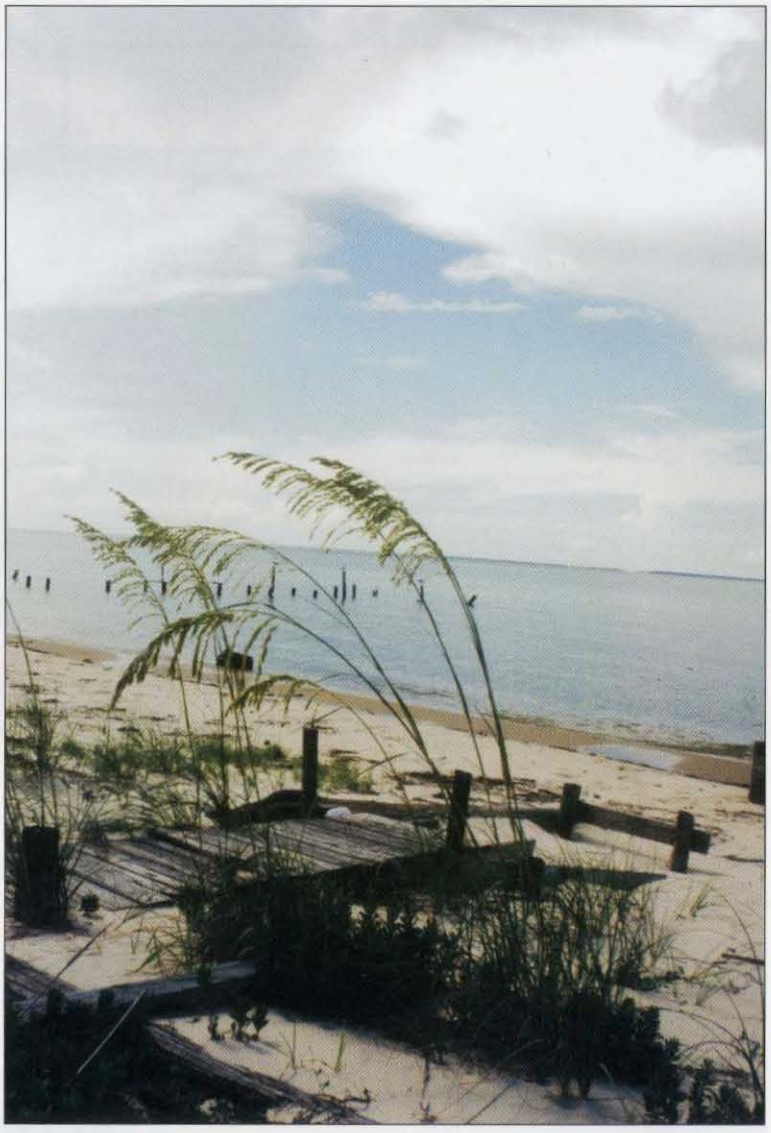
Wetlands have important capabilities for filtering chemicals and other pollutants from ground water runoff. Wetland plants are also able to absorb excess nitrogen and phosphorus from sewage runoff, thus preventing eutrophication of lakes, streams and bayous.

Crimson Pitcher Plant *(Photo by Jennifer Buchanan)*

Wetlands are often used as tertiary treatment facilities for domestic, industrial and storm water wastes. In many areas, wetlands may filter the pollution from faulty home sewerage systems. However, in over-populated areas with faulty septic tanks, there is not enough vegetation to efficiently filter the runoff. With the expansion of cities and receding ground and surface water supplies, wetlands are becoming more important as a source of ground and surface water. Overall, avoidance of wetland encroachment is the preferred goal, since placing waste directly into natural wetlands usually alters plant composition, and most wetlands have evolved over hundreds of thousands of years.

Over 95 percent of the commercial fish taken from the Gulf of Mexico depend upon the estuarine wetland habitats. Coastal wetlands serve as a nursery ground for shrimp, blue crab, oysters, redfish, speckled trout, mullet and various other finfish species.

Wetlands aid as recreation areas for fishing, hunting and observation of wildlife. Many areas along the Mississippi Gulf Coast are feeding and resting areas for neotropical birds migrating to and from South America.

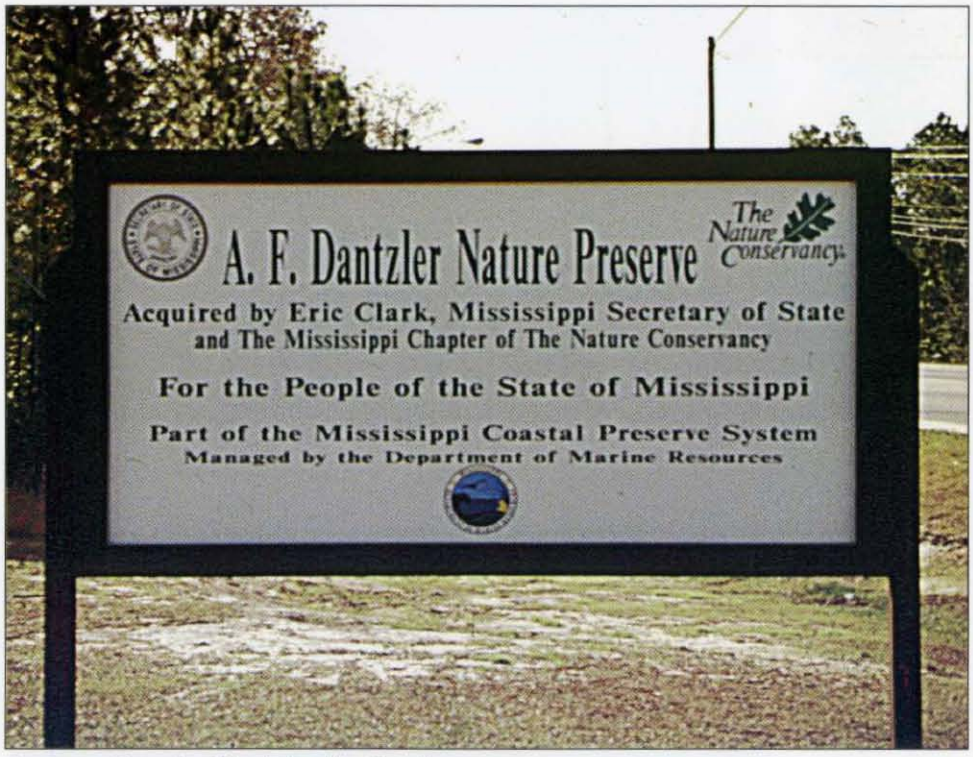


Bell Fontaine Beach, Jackson County *(Photo by Jennifer Buchanan)*

The abundance and productivity of Mississippi's wetlands are a product of the quantity and quality of the wetland habitat. The rapid loss and modification of the coastal wetland habitat has increased the need for management to maintain, improve and prevent further deterioration of this valuable resource.

Pressures and Stresses

Today, Mississippi's coastal wetlands are under attack from many sources. Pollution of both air and water, erosion, development, saltwater intrusion and non-native introduced species all contribute to the degradation of our coastal habitats.



Jackson County *(Photo by Jan Boyd)*

—POLLUTION—

Point source pollution is pollution which has a specific point of entry into the ecosystem. Examples of point sources include sewage treatment outfalls and industrial plant discharges. This pollution enters the coastal wetlands directly through pipes that discharge into our coastal waters.

Nonpoint sources of pollution (NPS) are those that cannot be pinpointed. These include impacts associated with urban, forestry, agricultural and recreational activities. NPS pollution can also enter our wetlands through rainfall and its associated runoff. The pollution associated with inadequate home septic systems installed in or near wetlands is currently one of the coast's most pressing problems. Runoff associated with these systems often enters our coastal wetlands and contaminates oyster beds and recreational waters. The DMR monitors our coastal wetlands to protect their ecological integrity, and many state and local governments are working to reduce the amount of pollution entering our coastal wetlands.

EROSION

Vegetated coastal wetlands in some parts of coastal Mississippi are eroding at an alarming rate. Waves generated by boats and storms eat away at the outer edges of the marshes and undermine the root systems of the marsh plants causing the outer edges of the marsh to slough off into the adjacent waterway.

The marshes of Point Aux Chenes Bay, Jackson County are being eroded away faster than any other marsh area in the state. This bay system was built up as a delta of the Escatawpa River. Hundreds of years ago the Escatawpa River was captured by the Pascagoula River and diverted away from the area. Because sediments were no longer being deposited there, the abandoned delta began to subside and erode away, leaving a retreating barrier island system to protect the remaining marshes. These Grand Batture Islands have since eroded away, and the entire marsh and bay shoreline is now under attack by wave activity.

Erosional forces are hard to control. Construction of (both floating and fixed) breakwaters and baffles, establishment of No Wake Zones, revegetation of shorelines and renourishment of beaches are all methods employed to try to reduce the erosion losses. Unfortunately, no one method is completely successful. Often methods used to slow erosion in one area accelerate erosion in other areas.

Development

Coastal wetlands have been and are being negatively affected by both residential and commercial/industrial development. Residential activities include the construction of piers, boat slips and ramps, and bulkheads for residential purposes. Commercial/industrial projects include marinas, casinos, boatyards, and seafood processing plants.

As the demand for waterfront facilities increase, so does the probable degradation of our coastal wetlands. Many small waterfront projects, each analyzed separately, do not appear to significantly degrade our coastal wetlands. However, adding all the impacts associated with each individual project together creates a much clearer picture—the impacts of all the small projects added together are more damaging to coastal wetlands than many of the coast's largest individual projects.

Mississippi's wetlands are protected by 1) the Mississippi Coastal Wetlands Protection Law 49-27-1 (1973), 2) Coastal Zone Management Act of 1972, and 3) the Mississippi Department of Marine Resources system of Coastal Preserves.

Saltwater Intrusion

Saltwater intrusion occurs when deepwater access channels are dredged into shallow bodies of water or when freshwater inflow is restricted. Because saltwater is heavier than freshwater, it sinks to the bottom and moves as a "wedge" up the channel changing the water from fresh to saline. Because plants within these disturbed areas are not salt tolerant, they begin to die out, and the marsh literally starts to disintegrate. Soon, a once healthy marsh turns into open water, and many of the functions of the coastal marsh are lost. Similar problems occur when freshwater inflow is redirected or decreased.

What you can do to help preserve Mississippi's wetlands:

- **Be aware of problems that occur in our wetlands.**
- **Use low-phosphate detergents.**
- **Don't pour pollutants such as used oil and paints into storm drains.**
- **Follow the recommended rates on labels when applying pesticides & fertilizers.**
- **Make sure your septic tank is in proper working order.**
- **Dispose of trash & wastewater properly when picnicking or boating.**

Get Involved! Everybody has a part to play in preserving our wetlands.

CONCLUSION

Future trends indicate that pressure to develop environmentally sensitive areas will continue well into the 21st century. As commercial, industrial and residential development continues along the Mississippi coastline, effective protection of valuable coastal resources can only be achieved through comprehensive planning, implementation of effective management programs, and through education and outreach programs.

The Mississippi Department of Marine Resources Coastal Preserves Program plays an important part in protecting and managing Mississippi's remaining coastal wetland ecosystems. Management objectives of the Coastal Preserves Program give the highest priority to the protection of these coastal wetland habitats in order to perpetuate their natural characteristics, features, ecological integrity, social, economic and aesthetic values for future generations. The DMR recognizes the importance of conserving and utilizing coastal wetlands as a natural resource essential to the functioning of the entire estuarine ecosystem.

Qualifying wetlands may be eligible for donation to the DMR or the Secretary of State's Office to be included in Mississippi's Coastal Preserves Program for conservation and preservation purposes. For more information on wetland protection and conservation programs call the DMR Coastal Preserves Program at (228) 374-5000.

GLOSSARY

Aquatic -
Living or growing in water.

Anaerobic/Anoxic -
Without oxygen.

Consistency statement -
A statement indicating whether or not a proposed activity or project will be undertaken in a manner consistent with the Mississippi Coastal Program.

Detritus -
Fragment of broken-down decaying material released into coastal waterways.

Ecosystem -
An interacting system that includes the organisms of a community and the components of their environment.

Epiphyte -
A plant that grows on another plant (the host) in order to be mechanically supported. An epiphyte does not gain nourishment from the host.

Erosion -
The wearing away of soil either by wind or water.

Estuary -
The portion of a body of water where fresh river waters mix with the salty seawater.

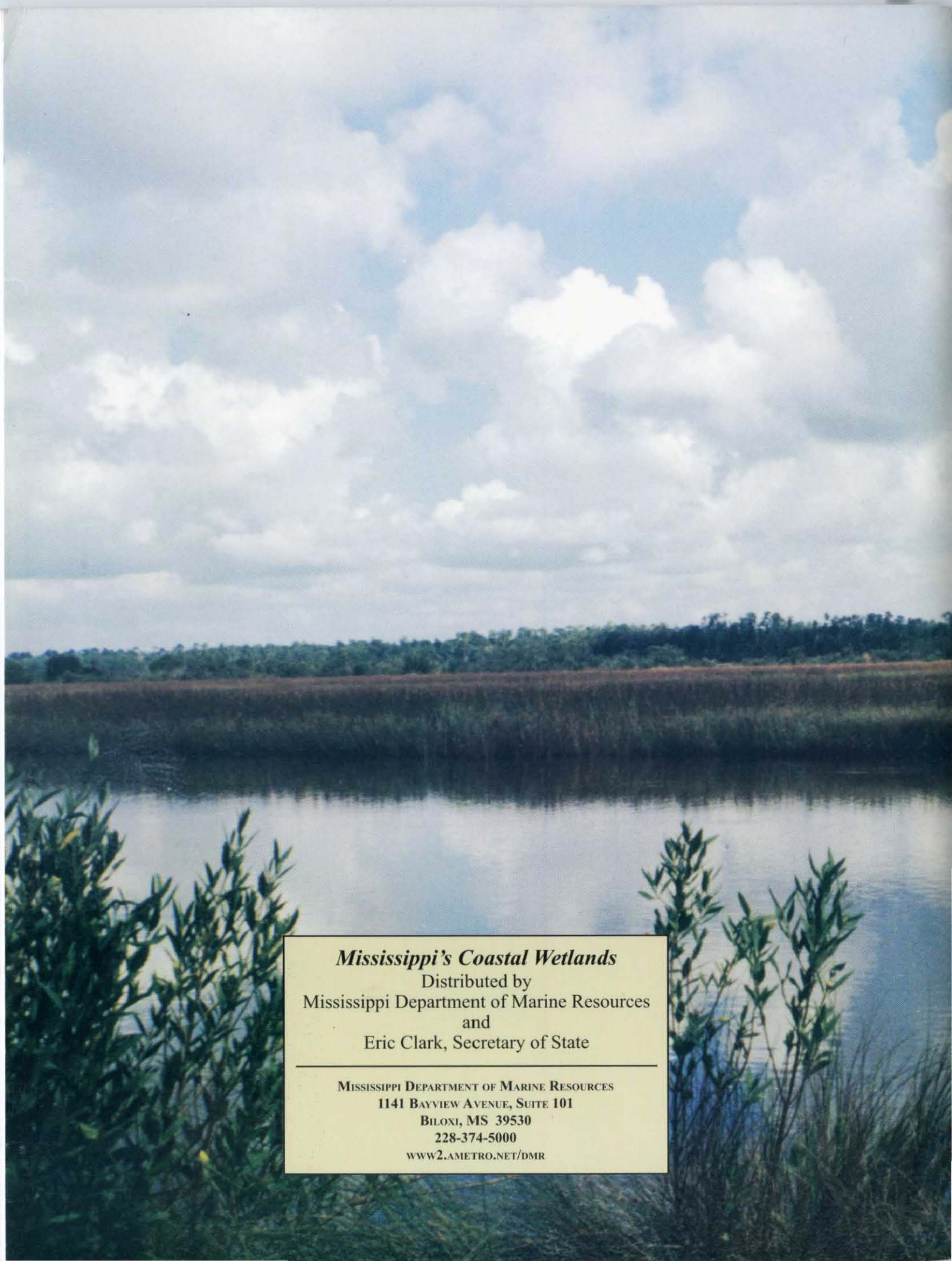
Habitat-
A specific type of place occupied by an organism.

Mitigation -
A three-step regulatory process that is used to minimize wetland loss. The three steps are avoidance, minimization and compensation.

Substrate -
The bottom material of a waterway or of a substance upon which an organism is growing.

Wetland -
An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

Cover photo by Linda Hughes
Center spread photos by Jan Boyd



Mississippi's Coastal Wetlands

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